

STRUCTURE 61

This structure is a reinforced concrete, gated spillway with discharge controlled by a cable operated, vertical lift gate, and a reinforced concrete lock structure with two pairs of sector gates. Operation of the spillway gate is manually controlled in accordance with seasonal operational criteria. The structure is located on Canal 35 at the outlet of Lake Tohopekaliga.

PURPOSE

This spillway structure maintains optimum water control stages in Lake Tohopekaliga; it passes the design flood (30% of the Standard Project Flood) without exceeding the upstream flood design stage, and restricts downstream flood stages and channel velocities to non-damaging levels; it prevents overtopping of the structure by the wind tide from Lake Tohopekaliga during the design storm though breaking waves will overtop the structure; it prevents overtopping of the structure during the Standard Project Flood, though it will be overtopped by the wind tide under such conditions; and it passes sufficient discharge during low-flow periods to maintain downstream stages and irrigation demands. The lock structure permits passage of vessels with a draft of less than 6' between the Kissimmee River (C-38) and Lake Tohopekaliga.

SPILLWAY OPERATION

This structure is operated in accordance with the Lake Tohopekaliga Regulation Schedule. This schedule, which ranges between elevations 51.5 and 55.0 indicates the desirable water level throughout the year. If the level is above the prescribed level, flood operation is followed; if the level is below the prescribed level, low-water operation is followed. The operation is also dependent on hydraulic and structural limitations of the structure.

Flood Operation

When the lake level is within 0.5 foot of the prescribed level, a release schedule, based on forecasted inflow, will be established to return the lake to that level within 15 days. When the lake stage is over 0.5 foot from the prescribed level, maximum releases, subject to hydraulic and structural limitation, will be made.

Low-water Operation

Whenever the lake level is below the prescribed level, minimum releases will be made to satisfy downstream irrigation and navigation demands.

Structural Limitations

The maximum water level drop across the structure will be 10.0 feet, if the upstream water surface elevation is below 55.0; 6.0 feet if the upstream water surface is between 55.0 and 59.9; and less than 6.0 feet if the upstream water surface is above 60.0.

Hydraulic Limitations

To prevent damage from high velocity discharge, the gate opening will be limited in accordance with the "Maximum Allowable Gate Opening Curve". Moreover, the gate shall be opened gradually to allow tailwater stages to rise before large releases are made.

LOCK OPERATION

The hydraulic system is designed to provide two gate speeds of operation. The normal speed is determined by the hydraulic pump capacity and will result in a peripheral gate speed of approximately 6.75 feet per minute which is equivalent to a full gate travel in three minutes. A manually variable slow speed is achieved by reducing the quantity of oil flowing to the hydraulic motor accomplished by energizing a solenoid valve thereby connecting in a variable flow bleedoff or bypass system. Slow speed will be considered as effecting a three feet per minute peripheral gate speed.

Starting and stopping of pump power unit and the direction and normal or slow speed of gate travel will be manually controlled by the operator except that the gate speed will automatically shift to slow for the last six inches of gate travel to either the full open or closed position. This six inch limit may be changed in the field as conditions dictate and the slow speed is manually variable by an adjustment of the flow control valve to compensate for seasonal or other extreme variations of differential water levels.

The schedule of lock operation, as established by the U.S. Corps of Engineers in accordance with the River and Harbor Act of August 8, 1917 (40 Stat. 266; 33 U.S.C.1) is as follows:

Monday through Friday	All Year	7:00 a.m. to 6:00 p.m.
Saturday and Sunday	Mar. 1 through Oct. 31	5:30 a.m. to 7:30 p.m.
Saturday and Sunday	Nov. 1 through Feb. 28	5:30 a.m. to 6:30 p.m.

FLOOD DISCHARGE CHARACTERISTICS

	Design		Standard Project Flood
	Lower Profile* Peak Stage*		
Discharge Rate	<u>1570</u> cfs	<u>2300</u> cfs	<u>2300</u> cfs
	<u>30</u> %SPF	<u>30</u> %SPF	<u>100</u> %SPF
Headwater Elevation			
Static	<u>53.1</u> feet	<u>54.7</u> feet	<u>59.9</u> feet
Wind Tide	<u> </u> feet	<u>59.1</u> feet	<u>62.7</u> feet
Wind Tide plus Breaking Wave Height	<u> </u> feet	<u>64.4</u> feet	<u>70.5</u> feet
Tailwater Elevation	<u>52.8</u> feet	<u>54.3</u> feet	<u>59.4</u> feet
Type Discharge	submerged <u>uncontrolled</u>	submerged <u>uncontrolled</u>	submerged <u>controlled</u>

*Peak Stage is based on lake operation for design flood which allows 2.0 feet of storage above historic average levels. Lower Profile is based on no rise in lake levels from historic average. Actual operation will probably be close to Lower Profile for the design flood.

DESCRIPTION OF SPILLWAY STRUCTURE

Type reinforced concrete, gated spillway

Weir Crest

Net Length 27.0 feet

Elevation 36.9 feet

Service Bridge Elevation 62.0 feet

Water Level which will by-pass structure 62.0 feet

Gates

Number 1

Size 18.1 ft. high by 27.8 ft. wide

Type vertical lift

Bottom elevation of gates, full open 54.9 feet normal
60.0 feet maximum

Top elevation of gates, full closed 55.0 feet

Control manual

Lifting Mechanism

Normal power source commercial electricity

Emergency power source LP gas engine-driven generator

Type Hoist hydraulic cylinder activated by electric motor driven
pumps with emergency hand pump, connected to
gate by steel cables.

Date of Transfer: January 30, 1964

ACCESS: from State Road 531 via county road and along access road on top of levee.

HYDRAULIC AND HYDROLOGIC MEASUREMENTS

Water Level Remote digital upstream and downstream recorder

Gate Position Recorder Remote digital recorder

SPILLWAY DEWATERING FACILITIES

Storage Okeechobee Field Station

Type fabricated steel bulkhead

Size and Number (per bay) 6 upstream, 5 downstream

1'-9" wide X 3'-6" high X 28'-7" long

DESCRIPTION OF LOCK STRUCTURE

Type reinforced concrete lock, with two pairs of gates

Operating Deck Elevations 62.0 feet

Lock

Length 90 feet

Width 30 feet

Invert Elevations 43.0 feet

Gates

Type Sector

Size 17.0 feet high; 19.25 feet radius

Control manual

Operating Mechanism

Normal Power Source commercial electricity

Emergency Power Source LP gas engine driven generator

Type double wire rope drum unit, with worm type special reducer,
powered by electric motor driven hydraulic motor

Dewatering Facilities

Location Okeechobee Field Station

Type Steel bulkheads

Size and Number 5 upstream and downstream

1'-6" wide X 3'-6" high X 31'-3" long